Remarks

Claims 1-15 remain in the application, and re-examination and reconsideration of the application are respectfully requested.

Claims 1-3 and 13-15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Popp et al. (U.S. Patent No. 5,683,752) in view of Medler et al. (U.S. Patent No. 4,957,782) and Matt (U.S. Patent No. 4,500,937). Popp et al. relates to a method and apparatus for applying an adhesive pattern onto a moving web. Referring to Fig. 1, a computer 138 provides command signals to a programmable limit switch 142 via an interface 140. The programmable limit switch is operative to control the operation of solenoids 58 that, in turn, open and close nozzles 50 dispensing adhesive onto a moving web 36. The location of the adhesive pattern 148 is detected by a camera 152 also connected to the computer 138. As described at col. 8, lines 38-67, the location and length of the adhesive pattern 148 is measured by camera system 154, which provides position signals to computer 138. If the adhesive pattern is out of position, the computer 138 provides a correction signal to the programmable limit switch 142, thereby modifying the operation of the solenoid 58 in order to change the timing of the operation of the nozzles 50.

Medler et al. relates to an automated painting system. Referring to Fig. 1, a robot control provides a first command FN having leading and trailing edges that represent respective on and off commands for the spray gun. A separate control unit provides a paint valve On signal FN' that is operable to energize a paint needle valve. The leading edge of FN' is adjustable by a delay dt. After the leading edge of FN', there is a delay T8 representing the valve actuation time and a delay T6 representing flight time of the paint. Thus, a switch-on time duration extends from the leading edge of the FN command at t_0 to the time the paint contacts the part at t_3. The objective is to maintain that switch-on time a constant independent of variations in the paint control system, for example, variations in the switching time of the paint needle valve. The duration of the actuation time of the paint needle valve is measured by a sensor 1 of Fig. 2, col. 5, lines 1-49 and is represented by the time

T8, shown in Fig. 1. A hypothetical longest possible switching duration is represented by T7. As described in col. 4, lines 10-25, the actual valve actuation time is measured and compared to a previously measured duration. If a difference is detected, a subsequent dt time is adjusted, thereby adjusting the leading edge of the valve On command FN'. A parameter control is also discussed that relates to the control of other parameters such as air, etc.

Matt relates to a control circuit for a solenoid driver of a dispenser having inherent pull-in and drop-out delays. Referring to Fig. 1, substrates 202 are moved past a dispenser 210 by a conveyor 200. A sensor 208 is spaced a fixed and known distance from the dispenser 210. The sensor 208 detects a presence of a substrate 202 and not the presence of fluid coated thereon. The sensor 208 provides a signal to a duration delay circuit module representing a leading edge 204 of the substrate 202. The delay duration module 212 also receives input pulses from an encoder 214, which represent speed of the conveyor 200 and the substrates 202. Knowing the location of the substrate leading edge 204 with respect to the dispenser 210 and the conveyor speed, the delay-duration module 212 executes a preselected delay representing the time required for the conveyor 200 to move the substrate 202, so that an initial point 206 at which fluid is to be initially deposited is located under the dispenser 210. After the preselected delay, the delay-duration module 212 provides an initial gun driver signal of a preselected duration. A compensator module 214 modifies the initial gun driver signal to compensate for pull-in and drop-out delays of the dispenser 210. The compensated initial gun driver signal operates the dispenser 210 to deposit fluid onto the substrate 202 independent of the pull-in and drop-out delays of the dispenser 210. It is Applicant's understanding that the pull-in and drop-out compensations within the compensator module 214 are fixed and not variable from one dispensing cycle to another.

In order to establish a prima facie case of obviousness, it is necessary that the Office Action present evidence, preferably in the form of some teaching, suggestions, incentives or inference in the applied art or, in the form of generally available knowledge, that one having ordinary skill in the art would have been led to

arrive at the claimed invention. Applicant submits that a prima facie case of obviousness is not made because Popp et al., Medler et al. and Matt in combination do not teach, suggest or motivate one to provide the elements recited in the claimed invention. Claim 1 requires a dispensing gun turn on and off in response to transition signals and feedback signals representing detected edges of fluid dispensed onto the substrate. Further, claim 1 requires measuring delays between the transition signals and a detection of corresponding edges of the fluid dispensed on the workpiece resulting from the transition signals.

In Popp et al., a camera system 154 measures a position of a dispensed adhesive pattern 148 and sends a position signal to computer 138. The computer 138 determines if the adhesive pattern 148 is out of position and, if so, generates and sends correction signals to programmable limit switch 142. Thus, Popp et al. relates to a position measuring system and does not describe, suggest or motivate one to measure delays between an occurrence of transition signals representing dispensing gun on and off operations and detecting corresponding edges of a fluid dispensed onto the substrate.

Medler et al. provides a command signal FN having leading and trailing edges representing respective on and off commands for the spray gun. A paint valve on signal FN' is adjustable by a delay dt that is varied by the measured actuation time of the paint needle valve. Medler et al. measures the needle valve actuation time and does not provide feedback signals representing detected edges of fluid dispensed onto the substrate. Thus, Medler el al. does not describe, express or motivate one to measure delays between occurrences of transition signals turning a dispensing gun on and off and detecting corresponding edges of the fluid deposited on the workpiece.

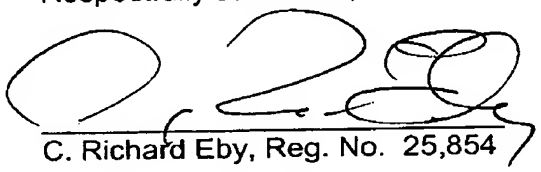
In Matt, the sensor 208 detects a presence of the substrate 202 and provides a compensation based on fixed pull-in and drop-out delays. It is Applicant's understanding that Matt does not detect edges 206 of the fluid deposited on the substrate 202 and that the compensations for pull-in and drop-out delays are fixed and not variable from cycle to cycle. Therefore, Matt does not measure delays

between occurrences of the on and off transition signals and a detection of edges of the fluid deposited on the substrate as required by claim 1.

Applicant further submits that a prima facie case of obviousness is not made because there is nothing in the cited references to suggest their combination. Matt is a basic system that provides a fixed compensation for the pull-in and drop-out delays of a dispensing solenoid. It is Applicant's understanding that Matt does not detect coated fluid 206 and that there is no variation of the pull-in and drop-out compensation based on feedback from the dispensing process. Medler et al. relates to an automated painting system and although not described, must have a part detection capability that is comparable to the sensor 208 of Matt. Further, Medler et al. measures the actuation time of a needle dispensing valve and thus, in contrast to Matt, provides a variable compensation for the pull-in delay based on needle valve performance. Matt provides no benefit to Medler et al., and their combination requires removing the variable compensation provided by measuring the actuation of the needle valve, thereby essentially destroying the invention of Medler et al. Popp et al. provides a vision-based position sensing and compensation system to account for delays in the dispensing system. Matt provides no benefit to Popp et al, and the technologies of Popp et al. and Medler et al. are directed to a common purpose but fundamentally incompatible. Therefore, Applicant submits that there is nothing in any of the references to motivate one to combine Pope et al. with Medler et al. or Matt with Pope et al. and Medler et al. In view of the above, Applicant submits that claims 1-3 and 13-15 are patentable and not obvious in view of Popp et al., Medler et al. and Matt.

Applicant submits that the application is now in condition for allowance and reconsideration of the application is respectfully requested. The Examiner is invited to contact the undersigned in order to resolve any outstanding issues and expedite the allowance of this application.

Respectfully submitted,



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